



# **Technological Research and Development Authority**



NASA - KSC/Florida  
Dual Use Technology Partnership

## ***SUMMARY OF RESEACH FINAL REPORTS***

March 12, 2001

*016111*

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# SUMMARY OF RESEARCH FINAL REPORT

NASA Grant #: NAG10-0275

Date of Report: 3/7/01

Grant Title: NASA-KSC/Florida Dual Use Technology Program

PI: David Kershaw

Technological Research and Development Authority  
5195 South Washington Avenue  
Titusville, FL 32780

Reporting Period: December 1, 1999 To November 30, 2000

## ***Introduction***

This document constitutes the Technological Research and Development Authority's (TRDA) Final Reports for the *NASA-KSC/Florida Dual Use Technology Partnership* grant covering the period December 1, 1999 through November 30, 2000. NASA Grant and Cooperative Agreement Handbook (NPG-5800.1D) requires the TRDA to provide NASA with a final report on Subject Inventions, Federal Cash Transactions, Summary Research, and Federally-Owned Property. This report contains those requirements (see Appendix A) as well as a description of the TRDA's grant performance related to activities undertaken, difficulties incurred, remedial actions, and the current financial status of the contract.

The NASA-KSC/Florida Dual Use partnership was designed to support the identification of promising new technology within NASA, leading to an increase of viable technology transfer and commercialization projects with dual use features. Utilizing experienced personnel and proven methodologies for accomplishing technology transfer, along with careful matching of the commercial activities of targeted companies

with the selected NASA technologies, the effort lead to the development of one dual use opportunity and one technology briefing during the partnership period. The sources of funding for this project were equally matched commitments from NASA-KSC and the TRDA totaling \$60,000.

### ***The NASA-KSC/Florida Dual Use Partnership Program***

The dual use partnership commenced in December of 1999 with the initiation of operations and communications protocols. This included activation of the TRDA's statewide technology-based, business network to maximize outreach potential.

Early in the grant period NASA-KSC issued internal calls for dual use projects. Indications were that the NASA Technology Programs and Commercialization Office was confident of selecting at least one technology for release during the grant, potentially in mid-summer of 2000. In the fall of that year the agency did identify a new technology for transfer to the commercial marketplace which qualified under the partnership agreement.

Under the terms of the agreement, NASA-KSC notified TRDA during the fourth quarter of a new technology for which they were seeking a commercial partner or partners. This new technology, referred to as the Universal Interface Adapter (UIA), allowed any commercial-of-the-shelf wireless headset to be tied into any communications system that requires signaling (e.g., push-to-talk signals) not provided by the headset.

NASA-KSC believed the technology had many applications in both the government arena and the commercial marketplace. UIA benefits were identified primarily for end users with frequent and high-mobility communications, including launch control, air traffic control, law enforcement, emergency response, and telemarketing. Pursuant to the agreement, the TRDA implemented a statewide outreach initiative to identify potential Florida businesses capable of commercializing the technology for NASA.

To reach the Florida-based headset, wireless messaging or other communications devices business community, the TRDA initiated a phone, fax and e-mail campaign to its network of organizations throughout the state including:

- Regional Economic Development Organizations (EDOs)
- Florida's Manufacturing Technology Centers (FMTC)
- Florida's Innovation Commercialization Centers (ICC)
- University Research Centers
- Technology-based community college business incubation centers
- Florida Small Business Development Centers

TRDA also contacted 62-targeted wireless technology firms regarding the technology opportunity. These businesses received faxed and/or email information describing the technology. The briefing materials that were distributed included an Announcement of Opportunity and a three-page technology summary detailing the UIA's benefits, functions, commercial applications/opportunities. A sample briefing packet can be found in Appendix B.

On December 8, 2000 NASA-KSC held a technology briefing for prospective licensees of the UIA. One of the four companies attending the briefing was a Florida business originally contacted by the TRDA. Subsequent to the briefing NASA-KSC was to begin accepting commercialization plans for the UIA and pursuant to NASA's selection process begin licensing the technology to one or more companies in 2001.

NASA-KSC reported their extreme satisfaction with the effectiveness of the TRDA's comprehensive marketing strategy for the Dual Use initiative and requested a new proposal to provide similar services again. In any future partnership the TRDA plans to work closely with its network of minority colleges and universities and the state's rural development agencies to promote the program in those areas of the state that may not have been emphasized in existing promotions for technology transfer programs.

### *Nice3 Program*

Before the identification of the Universal Interface Adapter technology opportunity, TRDA also assisted NASA with the evaluation of a grant project to the U.S. Department

of Energy's *National Industrial Competitiveness through Energy, Economics, and Environment* (NICE<sup>3</sup>) program. This national initiative funds the first commercial demonstration of industrial technologies that save energy, reduce pollution and help improve the cost competitiveness of certain industrial sectors. The potential grant opportunity with NICE<sup>3</sup> involved a flue gas cleansing technology being developed and tested at KSC.

#### *Technology Venture Corporation Business Plan*

In addition to the investigation of the NICE<sup>3</sup> grant opportunity, the TRDA in full cooperation with NASA, also conducted planning activities related to the development of an enhanced technology commercialization program supporting Kennedy Space Center. The work involved examining the viability of a unique business model for supporting the spin-off of internal technologies and the development and acquisition of new technologies required by NASA at KSC through an external technology commercialization organization. The focus of this effort was an innovative enterprise recently started by the Central Intelligence Agency (CIA).

The enterprise, known as "In-Q-Tel," is a technology solution house for the CIA that leverages the resources of the commercial information technology marketplace to develop solutions to the CIA's technology problems. The TRDA investigated the creation of a focused technology venture corporation like In-Q-Tel to 1) streamline the development of technologies to support NASA-KSC's requirements and 2) leverage the resources of the commercial marketplace. These efforts would be expected to yield solutions to NASA technology problems and create commercially viable, profitable products. Key to the concept was the access TRDA has to the \$150 million of Florida Certified Capital Company (CAPCO) funding and other venture capital sources. Several briefings were conducted with KSC commercialization staff over the course of the concept development process. The expected outcomes from the successful deployment of the concept included significant job creation and technology commercialization.

A portion of the business plan produced for this project is included in Appendix C.

### ***Financial Summary***

Total funds received from NASA through November 30, 2000 amount to \$30,000. Program support contributed by TRDA as match amounted to \$30,000. These combined sums (\$60,000) represent the entire partnership budget.

Reporting From: Initiation To November 30, 2000

<b>1. DIRECT LABOR (salaries/FB)</b>	<b>\$33,000</b>
<b>2. OTHER DIRECT COSTS</b>	<b>\$27,000</b>
a. Outside Services	\$16,624.53
c. Equipment	\$0.00
d. Supplies	\$0.00
e. Travel	\$9,735.30
f. Other	\$640.17
<b>3. INDIRECT COSTS      0%</b>	<b>\$0.00</b>
<b>4. OTHER APPLICABLE COSTS</b>	<b>\$0.00</b>
<b>5. TOTAL COSTS</b>	<b>\$60,000</b>

### ***Conclusion***

The grant period represented an exciting and challenging new beginning for the *NASA-KSC/Florida Dual Use Technology Partnership* grant. The TRDA is hopeful that this program will continue to provide significant public benefits in the future for technology development and commercialization.

This summary and the attached appendices complete the TRDA's Final Report for the contract period from December 1, 1999 through November 30, 2000. Any questions or comments should be directed to David Kershaw, *KSC/Florida Dual Use Technology Partnership* Program Manager at 321-267-5601.

**Appendix A: Final Reports**  
**Subject Inventions, Federal Cash Transactions,**  
**Federally-Owned Property**



## **Final Reports**

### **Subject Inventions Final Report**

No Subject Inventions are required to be disclosed pursuant to this grant. (See attached—Report of New Technology/Inventions.)

### **Final Federal Cash Transaction Report**

The final Federal Cash Transaction Report was to be submitted the week of March 11, 2001. There is currently no unexpended balance of funds associated with this grant.

### **Final Inventory Report of Federally-Owned Property**

No special purpose or general purpose equipment was acquired with the grant funds.

**REPORT OF NEW TECHNOLOGY/INVENTIONS**  
(Required by New Technology or Patent Rights Clause)

1. Name and Address of Contractor -

**Technology Research & Development Authority**  
**Attn: David Kershaw**  
**6750 South US Highway 1**  
**One Baylor Plaza**  
**Titusville, FL 32780**

2. Contract/Grant Number - **NAG10-0275**

3. List each New Technology/Invention by Title and Innovator's Name.

NONE

**NOTE: For each New Technology/Invention fill out a detailed description (including drawings) on NASA form 1679.**

4. List each New Technology/Invention on which Contractor elects to retain title.

NONE

5. List subcontracts containing New Technology or Patent Rights Clause (if "None", so state). Provide name, address and subcontract number.

NONE

6. Certification is hereby made to the following: (check "a" or "b")

- ☐ a. New Technology/Inventions listed above are all of the items required to be reported.  
☒ b. No New Technology/Inventions were made under the contract/grant identified above.

Frank Kinney, Exec. Dir., TRDA  
Name/Title of Authorized Contractor

  
Signature

Date: 11/29/00

## **Appendix B: Universal Interface Adapter Company Briefing Packet**



## **Technological Research and Development Authority/ NASA-Kennedy Space Center**

### **Announcement of Opportunity**

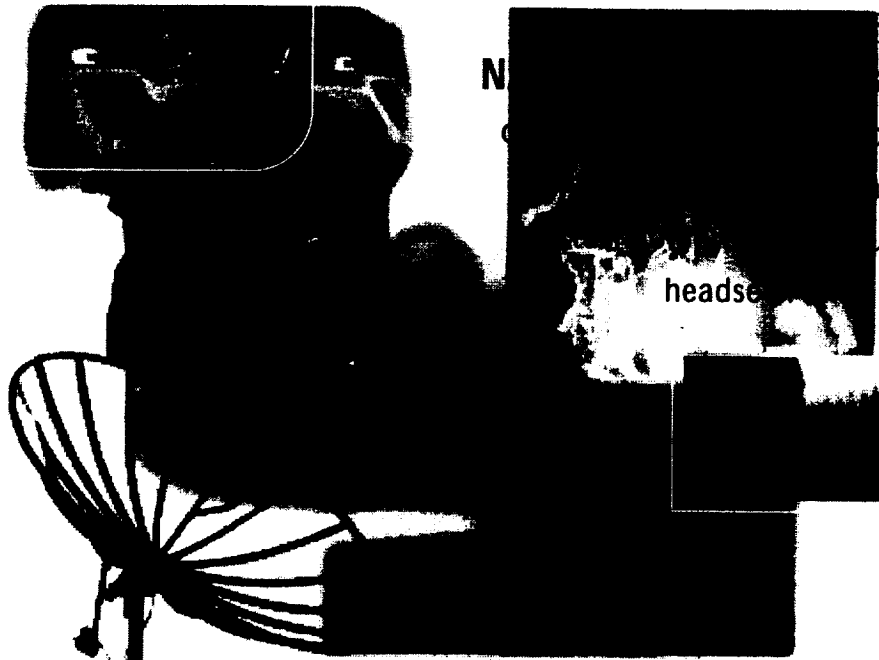
NASA-Kennedy Space Center (KSC) invites inquiries from interested commercial companies and manufacturers of headsets, wireless messaging or other communications devices to participate in a technology licensing opportunity. Developed at Kennedy Space Center, the technology is called a **Universal Interface Adapter (UIA)**. The UIA permits interfacing of any commercial-off-the-shelf wireless headset and any communications equipment that requires signaling (e.g., push-to-talk signals) not provided by the headset. The UIA can benefit end users with frequent and high-mobility communications, including launch control, air traffic control, law enforcement, emergency response, and telemarketing.

The Technological Research and Development Authority (TRDA) is supporting NASA-KSC in soliciting companies to commercialize the UIA technology. Attached is a brief *Technology Opportunity Announcement* that provides more detail.

If your company has interest in initiating licensing discussions or can recommend other companies for whom this will make a good product fit, please contact the TRDA's Dave Kershaw by phone at (321) 269-6330 or by e-mail at [dkershaw@trda.org](mailto:dkershaw@trda.org) no later than September 29.

Thank you for your consideration of this opportunity.

# Wireless Communications Headset Subsystem to Enhance Signaling



NASA Kennedy Space Center has developed a universal adapter for communications headsets, such as phones, radios, and broadcast systems. This technology permits the interfacing of any commercial off-the-shelf (COTS) wireless headset and any communications equipment that requires signaling (e.g., push-to-talk signals) not provided by the headset.

## **Benefits**

- **Signaling capabilities**—Enables remote wireless signaling to answer phones, switch lines, integrate radio communication, and perform many other functions
- **Ease of construction**—Constructed using COTS components
- **Compatible with standards**—Operates in the conventional 900-MHz industrial, scientific, and medical (ISM) frequency bands
- **Low noise**—Minimizes background noise in push-to-talk applications

## **Commercial Applications**

Jobs that require frequent communication and high mobility would benefit from this invention:

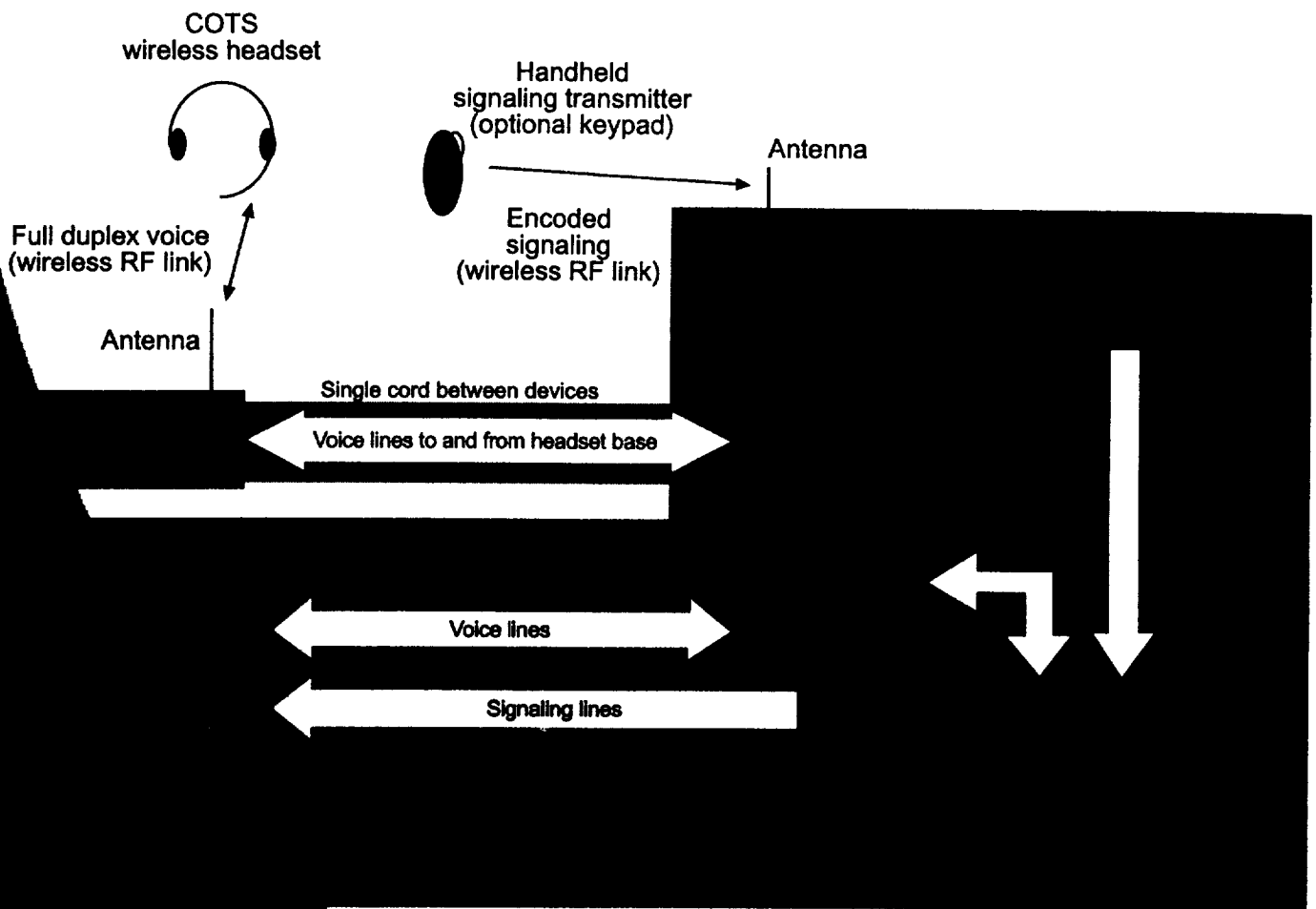
- Launch control
- Air traffic control
- Law enforcement
- Emergency response
- Telemarketing

This device also can be used with any wired headset with special signaling.



National  
Aeronautics  
and Space  
Administration

## Universal Interface Adapter (UIA) Function



The diagram above illustrates how the UIA links the components of a communications system. The user wears a COTS wireless headset and a handheld signaling transmitter with optional keypad that can be hand-held or fastened to a belt. The wireless headset provides a full duplex voice connection to the headset system base. The signaling transmitter provides an encoded signaling message to the UIA. The UIA connects the headset system to the communications system to provide the functional link between the user and the communications system. The UIA provides a functional link to the communications system.



## Technology

NASA Kennedy Space Center has developed a new technology for use with wireless communications headsets. Most COTS wireless headsets transmit and receive continuously without the option for push-to-talk or other signaling (e.g., external hook and on-hook signals) offered by wired systems. However, NASA needed wireless push-to-talk signaling in its launch operations and initiated a development effort. The technology developed also would benefit communications systems used by the Department of Defense, air traffic controllers, law enforcement and public safety (e.g., 911) call centers, and even commercial call centers (e.g., telemarketing).

NASA's universal interface adapter is a wireless subsystem that provides push-to-talk signals to a communications system as if the user were directly wired to the system. The prototype includes a push-to-talk unit (i.e., a low-power auxiliary radio transmitter) carried by the user and an auxiliary radio receiver at the base station. To transmit, the user keys the push-to-talk unit, sending a signal to the receiver. Upon receiving this signal, the base auxiliary radio generates a control signal that turns on the audio circuits at the base station. NASA is using this prototyped interface successfully in its launch operations.

Operating in the 900-MHz ISM frequency band, the technology permits multiple users to operate independently in the same environment without interference. The technology can be used with any COTS wireless headset and communications system without modification, or it can be directly integrated into headsets and systems to perform various telephony functions, such as dial-tone-multifrequency (DTMF) delivery and on/off-hook signals.

## Commercial Opportunity

This technology is part of NASA's technology transfer program. This program seeks to promote the commercial use of NASA-developed technologies. A patent is pending on the universal interface adapter, and NASA invites commercial companies to consider licensing or jointly developing this technology. NASA is flexible in its agreements, and licensing opportunities exist for exclusive, nonexclusive, and field-of-use licensing.

## For More Information

If you would like more information about this technology or about NASA's technology transfer program, please contact:

NASA Technology Applications Team  
Research Triangle Institute  
Phone: (919) 541-7202

More information about NASA technology licensing opportunities is available online:

[www.rti.org/technology](http://www.rti.org/technology)



**Appendix C: Technology Venture Corporation  
Business Plan Excerpt**



**A Technology Development Venture Corporation for NASA-  
KSC**

May 2000

Proposal and Preliminary Business Plan

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Technological Research and Development Authority  
5195 South Washington Ave.  
Titusville, FL 32780  
321-269-6330

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## Background

*In 1999, the Technological Research and Development Authority began examining the viability of a unique business model for supporting the spin-off of internal technologies and the development and acquisition of new technologies required by NASA at the Kennedy Space Center. The focus of this inquiry was an innovative enterprise recently started by the Central Intelligence Agency (CIA) and first brought to our attention by Mr. Daniel C. Tam, Assistant to the Administrator for Commercialization at NASA.*

*The enterprise, now known as "In-Q-Tel," is a technology solution house for the CIA that leverages the resources of the commercial Information Technology marketplace to develop solutions to the CIA's technology problems. Through a series of conversations and meetings with In-Q-Tel's top management and legal counsel, the TRDA compiled a considerable amount of information regarding In-Q-Tel. This document draws from the In-Q-Tel model to formulate a similar concept that can be instituted to serve NASA-KSC in the same way that In-Q-Tel serves the CIA.*

## **Executive Summary**

While budget reductions for R&D among federal agencies result in frustration for government scientists and technologists, entrepreneurs are basking in their well-funded research budgets thanks to the huge number of private investors with an eye for the phenomenal profit potential of technology innovation. Many of NASA's technologies and problem solutions have far-reaching applications in commercial sectors. If NASA is to maintain leading-edge technology deployment and solutions, it must redefine its methods and determine the best approach to leveraging private investment funds.

TRDA proposes a NASA-KSC focused technology venture corporation to streamline the development of technologies to support NASA-KSC's requirements and leverage the resources of the commercial marketplace. The efforts will yield solutions to NASA technology problems and will create commercially viable, profitable products. Key components are the access TRDA has to the \$150 million of Florida Certified Capital Company (CAPCO) funding and other venture capital sources.

The organization will work with NASA, aerospace contractors, technology companies, entrepreneurs, universities, and R&D labs. In turn it will structure commercially attractive technology development deals using equity investments, royalty provisions, etc. that will lead to off-the-shelf solutions and an income stream from successful commercialization. It will work in cooperation with a NASA-KSC InterfaceTeam (IT) to help NASA-KSC staff make the shift to using an outside organization for technology development and to identify technologies with great potential.

The private, not-for-profit venture will:

- Work with staff at NASA-KSC to identify priority problems and developable solutions,
- Select and refine those solutions that have commercial profit potential,
- Identify and assist companies and entrepreneurs that can develop the solutions for NASA and commercial markets, and
- Identify and broker venture capital deals to support development efforts.

The organization will also use experts to brainstorm the implications of emerging technologies and trends using a think-tank approach. Like a development lab, the company will help fund prototypes and give NASA-KSC an opportunity to examine potential solutions before deployment. Like a consulting and professional services firm, it will assist organizations, help identify undervalued

assets and bring NASA to the table as a power-user of the potential product. Like a strategic investor, it will provide value-added services to its investments.

TRDA proposes the submission of this Business Plan as an unsolicited grant proposal to NASA-KSC. It is general in many respects to allow future leadership the versatility that will be required for growth as the model matures. The concept is offered to NASA-KSC as a pilot program in partnership with the state of Florida and the Technological Research and Development Authority. This approach simplifies the partnership process and minimizes the project risk for KSC by using TRDA as an intermediary. As the program matures, it will reach out to other NASA centers to ensure that technologies with great potential are recognized and included.

The initial operating budget for the partnership is \$750,000 and includes \$150,000 from NASA-KSC, \$250,000 from TRDA and \$350,000 provided by NASA Headquarters. Initial technology investment funding can be leveraged from CAPCO through its Atlantic FirstRound Partners affiliate, a TRDA initiated organization.

## **Mission**

As a non-profit group, the venture organization will be operated exclusively for charitable, scientific, and educational purposes. Several tasks comprise the main thrust of the group, which will be to provide the guidance, assistance and access to resources to develop technologies with private funds that have importance to NASA-KSC and great profit potential in commercial markets.

The mission includes:

1. Identify innovations, technologies, and companies with commercial profit potential and applications for NASA-KSC,
2. Help NASA-KSC advance space exploration and commerce by partnering to fast-track the development of relevant technologies,
3. Identify venture capital sources and develop private funding mechanisms to expedite the development of target technologies and companies,
4. Assist in the development of technologies and companies for deployment in commercial markets and NASA field centers,
5. Help NASA-KSC to lower costs and reduce the tax payer burden of funding space, and
6. Foster the timely development of space technology that will benefit the public, private, and academic sectors in the United States.